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"Preserving Women"

Refrigerator Design as Social Process in the 1930s

SHELLEY NICKLES

In 1940, Sam Vining, Westinghouse's director of department store sales, complained about the way one novice salesman demonstrated a refrigerator to a prospective customer:

He caught hold of the door handle, and he said, "Look, this door handle moves three ways." And the woman was supposed to drop dead. Now, what the hell difference does it make to the refrigerator how many ways that door handle moved? . . . Fifty per cent of our business is preserving women, not fruit, and it makes a lot of difference to the woman whether she can walk over with her arms full of something and it will open in any direction she wants. But that salesman didn't tell her that—he was selling merchandise, not people.¹

Vining's vignette of the lackluster salesman, the hardworking homemaker, and the three-way door handle vividly captures the relationship forged during the 1930s between household appliance design and consumers. Consumers experienced new domestic technologies, and therefore the process of modernization, in large part through the mediating influ-

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1. "The Nudes Have It," *Fortune*, May 1940, 75. On the gender politics of appliance selling, see Joy Parr, *Domestic Goods: The Material, the Moral, and the Economic in the Postwar Years* (Toronto, 1999), 199–217.

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ence of industrial design. Design elements were related only tangentially to the technical function of the refrigerator as a food preservation device, but were central to its perceived social function of “preserving women” by aiding the servantless housewife. Historians of household technology have asked how the refrigerator “got its hum,” but not how it got its streamlined curve, vegetable drawer, or door handle. This study of refrigerator design in the 1930s suggests that an exploration of industrial design as part of a larger process of social interaction offers insight into how new technologies were domesticated, on whose terms, and with what social consequences.²

As this 1940 anecdote reveals, manufacturers, marketers, and designers had created a notion of a generic, “average” consumer from the increasingly diverse demographics of the real women who purchased mechanical refrigerators in a decade when ownership climbed from 8 percent to 44 percent of American households.³ Contrasting to the upper-class consumer of the appliance’s early years, it boiled down to this deceptively simple portrait: a homemaker in a depression economy, without servants or other helpers, who found herself in the kitchen opening the refrigerator door with both hands full (fig. 1). She valued thrift, efficiency, convenience, and modern food preservation methods for her family. Vining’s exasperation with his

2. Ruth Schwartz Cowan, “How the Refrigerator Got Its Hum,” in *The Social Shaping of Technology: How the Refrigerator Got Its Hum*, ed. Judy Wajcman and Donald MacKenzie (Philadelphia, 1985), 202–18. Cowan argued that corporate factors determined the ultimate success of electric refrigeration in the competition between gas and electric technologies for household consumption. Excellent sociological studies that explore the gendered mutual shaping of design and use in Europe may be found in Cynthia Cockburn and Ruth Furst-Dilic, eds., *Bringing Technology Home: Gender and Technology in a Changing Europe* (Buckingham, 1994). Nina E. Lerman, Arwen Palmer Mohun, and Ruth Oldenziel, in “The Shoulders We Stand On and the View from Here: Historiography and Directions for Future Research,” *Technology and Culture* 38 (1997): 9–30, suggest the need for historically situated comparisons. Judy Wajcman, *Feminism Confronts Technology* (University Park, Penn., 1991), 106, called for historians of technology to examine the design of household appliances. For a Canadian analysis, see Parr. Jane Busch, “Cooking Competition: Technology on the Domestic Market in the 1930s,” *Technology and Culture* 24 (1983): 222–45, examines the role of design in defining technologies as modern in the 1930s. For a study of household appliance design as part of a larger process of social interaction in twentieth-century America, see Shelley K. Nickles, “Object Lessons: Household Appliance Design and the American Middle Class, 1920–1960” (Ph.D. diss., University of Virginia, 1999).

3. Stanley Lebergott, *Pursuing Happiness: American Consumers in the Twentieth Century* (Princeton, N.J., 1993), 113. Refrigerator sales rose steadily during the Great Depression as prices decreased, with sales dropping only in 1932 and 1938. On the expansion of refrigerator ownership during the 1930s, see Robert C. Haring, *Marketing of Mechanical Household Refrigerators* (Missoula, Mont., 1963). To place the refrigerator and home appliance industry within the larger context of the depression economy, see Michael A. Bernstein, “Why the Great Depression was Great: Toward a New Understanding of the Interwar Crisis in the United States,” in *The Rise and Fall of the New Deal Order*, ed. Steve Fraser and Gary Gerstle (Princeton, N.J., 1989).



FIG. 1 Refrigerators were designed to appeal to an average homemaker both aesthetically and practically. (*Servel Electrolux*, 1937, Trade Catalog Collection, Smithsonian Institution Libraries, National Museum of American History Branch, Washington, D.C. Courtesy Smithsonian Institution Libraries.)

salesman hinted at the conflict-ridden and complex process of conceiving this average consumer and designing her refrigerator.

This article explores the social process of designing refrigerators in the 1930s. I argue that industrial design was central to manufacturers' struggles to redefine the refrigerator from an expensive luxury item for the wealthy few to an affordable, laborsaving, food preservation device for a broad market of "servantless housewives."⁴ When electric and gas refrigerators

4. This theme is further developed in Nickles, chap. 2. On the need to examine particular categories of goods and their different systems of provisions, see Ben Fine, "From Political Economy to Consumption," in *Acknowledging Consumption: A Review of New Studies*, ed. Daniel Miller (London, 1992), 142–43. For critical examination of the development of household appliances as laborsaving devices connected to the rise of the "servantless housewife," see Ruth Schwartz Cowan, *More Work for Mother: The Ironies of*

became available for domestic use following World War I, their design and marketing (fig. 2) largely reflected their status as prestige products intended for elite households.⁵ In the late 1920s and early 1930s, technological advances in gas and electric refrigeration, the adoption of standardization and mass production, and increased competition caused prices to fall steeply.⁶

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Household Technology from the Open Hearth to the Microwave (New York, 1983), and Susan Strasser, *Never Done: A History of American Housework* (New York, 1982). For a British comparison, Sue Bowden and Avner Offer, "The Technological Revolution that Never Was," in *The Sex of Things: Gender and Consumption in Historical Perspective*, ed. Victoria de Grazia (Berkeley, Calif., 1996), 244–74. In recent years, design historians have used these arguments as a framework for understanding the cultural meanings of industrial design. See Ellen Lupton and J. Abbott Miller, *The Bathroom, The Kitchen, and the Aesthetics of Waste: A Process of Elimination* (Princeton, N.J., 1992); Penny Sparke, *Electrical Appliances: Twentieth Century Design* (New York, 1987). Adrian Forty, *Objects of Desire: Design and Society Since 1750* (London, 1986; reprint, New York, 1992), 207–22, focuses on the use of servants in British households.

5. In 1923 only twenty thousand households in the entire United States had mechanical refrigerators. As late as 1927, 60 percent of the nation's households had no form of refrigeration at all. The vast majority of those that did have refrigeration used ice, but only 17 percent of those households had year-round ice delivery. David Nye, *Electrifying America: The Social Meanings of a New Technology* (Cambridge, Mass., 1990), 275; Ronald C. Tobey, *Technology as Freedom: The New Deal and the Electrical Modernization of the American Home* (Berkeley, Calif., 1996), 18. On the early years of the icebox industry and the development of the mechanical refrigerator industry, see Oscar Edward Anderson Jr., *Refrigeration in America: A History of a New Technology and Its Impact* (Princeton, N.J., 1953). See also Haring. On the assumption of a luxury market and early advertising, see Nye, 240–68; for refrigerator advertising specifically, see Peter R. Grahame, "Objects, Texts, and Practices: The Refrigerator in Consumer Discourses Between the Wars," in *The Socialness of Things: Essays on the Socio-Semiotics of Objects*, ed. Stephen Harold Riggins (New York, 1994), 285–308. Alice Bradley, *Electric Refrigerator Menus and Recipes: Prepared Especially for General Electric Refrigerator*, 5th ed. (Cleveland, 1929), admitted that the refrigerator was still a "novelty." For a good summary of early refrigerator design, see Scott Alan LaFrance, "'A Man's Castle is a Woman's Factory': Streamlining and Electric Kitchen Appliances" (master's thesis, University of Delaware, 1989); "Refrigerators Began to Sell after 1913," *Electrical Merchandising* 89 (July 1957): 118–19.

6. On the problems that plagued electrical refrigerators in the 1920s, the technological advances made by the mid-1930s, and standardization and mass production, see Anderson, 214. See also "That Refrigeration Boom," *Fortune*, December 1943, 163; "An Early History of the Electric Refrigerator," *Electrical Merchandising* 89 (July 1957): 116–17, 216; Glenn Muffly, "Twenty-five Years of Household Electric Refrigerator Development," *Ice and Refrigeration* 101 (July 1941): 38–44. On the adoption of mass production techniques, see also Harold Van Doren, "Streamlining: Fad or Function?" *Design* 10 (October 1949): 2–5, 28; "Refrigerators on the Line," *Du Pont* 33 (September 1939): 13–16. Kerosene refrigerators comprised a small portion of the market in the 1930s. The average price of electric refrigerators dropped from \$600 in 1920 to \$292 in 1929, and to \$152 in 1940, but during the 1930s retailers often sold refrigerators below manufacturers' list cost. On the reduction in prices and new competitors, see Haring, 12–38. See also Richard Tedlow, *New and Improved: The Story of Mass Marketing in America* (New York, 1990).



FIG. 2 Prestige and novelty were common themes in early refrigerator advertisements. (*Servel Sales, Heat that Freezes*, 1928, Trade Catalog Collection, Smithsonian Institution Libraries, National Museum of American History Branch, Washington, D.C. Courtesy Smithsonian Institution Libraries.)

At the same time, advertising, installment credit plans, and the educational efforts of home economists spurred demand.⁷ By the middle years of the

7. Roland Marchand, *Advertising the American Dream: Making Way for Modernity, 1920–1940* (Berkeley, Calif., 1985); Neil Borden, *The Economic Effects of Advertising* (Chicago, 1944), 396–421. On installment buying, see Martha L. Olney, *Buy Now, Pay Later: Advertising, Credit, and Consumer Durables in the 1920s* (Chapel Hill, N.C., 1991); Alan Roy Berolzheimer, “A Nation of Consumers: Mass Consumption, Middle-Class Standards of Living and American National Identity, 1910–1950” (Ph.D. diss., University of Virginia, 1996); Kenneth Dameron, ed., *Merchandising Electrical Appliances* (New York, 1933), 14. After World War I, utilities hired home economists to expand their market to the middle class in order to increase the demand for power, and the scope of this work

Great Depression, New Deal electrification and loan policies further extended the potential market for mechanical refrigerators.⁸

The ability to produce a reliable, affordable refrigerator only brought new questions about this market: who were these new consumers and what did they want? This article begins with a discussion of the ways an expanding market forced the leading producer, Frigidaire, to abandon its outdated notion of the refrigerator as a prestige product for an elite consumer. Though manufacturers understood that potential buyers existed at different income levels, the necessity of reconciling mass production of standardized goods with growing market diversity led them to focus on an average consumer in the middle of the market.⁹

The task of interpreting the needs and values of this average consumer fell to a new group of industrial designers who had their own elite, modernist agenda and gender biases concerning the styling of household technology. As designer Lurelle Guild's work for Servel refrigerators shows, the result was a tug-of-war between male designers and female consumers, but also implicitly between consumers of different social groups.¹⁰ Guild and

greatly expanded between 1925 and 1930. See Carolyn M. Goldstein, "From Service to Sales: Home Economics in Light and Power, 1920–1940," *Technology and Culture* 38 (1997): 121–52; Ronald R. Kline, "Agents of Modernity: Home Economists and Rural Electrification, 1925–1950," in *Rethinking Home Economics: Women and the History of a Profession*, ed. Sarah Stage and Virginia B. Vincenti (Ithaca, N.Y., 1997), 237–52; Mark H. Rose, *Cities of Light and Heat: Domesticating Gas and Electricity in Urban America* (University Park, Pa., 1995).

8. Gregory B. Field, "'Electricity for All': The Electric Home and Farm Authority and the Politics of Mass Consumption, 1932–35," *Business History Review* (spring 1990): 32–60; Tobey; Ronald H. Kline, *Consumers in the Country* (Baltimore, 2000), 131–211.

9. On mass production as a disincentive to variety, see David A. Hounshell, *From the American System to Mass Production, 1800–1932: The Development of Manufacturing Technology in the United States* (Baltimore, 1984); Philip Scranton, "Manufacturing Diversity: Production Systems, Markets, and an American Consumer Society, 1870–1930," *Technology and Culture* 35 (July 1994): 476–505; John Heskett, *Industrial Design* (London, 1980), 72. On the construction of national markets for branded, standardized goods, see Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York, 1989). On the way that design standards for mass production led to a focus on an average consumer, see Ben Nash, *Developing Marketable Products and Their Packagings* (New York, 1945), 19–25. On the construction of the "average" consumer in this period, see Olivier Zunz, *Why The American Century?* (Chicago, 1998), chap. 3.

10. See Jeffrey L. Meikle, *Twentieth-Century Limited: Industrial Design in America, 1925–1939* (Philadelphia, 1979), for an insightful account of the emergence of industrial designers as mediators in the context of a developing consumer culture, though he does not address gender or class relationships. On the importance of class as a category of analysis in consumption studies, see Victoria de Grazia and Lizabeth Cohen, "Class and Consumption: Introduction," *International Labor and Working-Class History* 55 (spring 1999): 1–5. For an analysis of taste in terms of competition between social groups, see Pierre Bourdieu, *Distinction: A Critique of the Judgment of Taste*, trans. Richard Nice (Cambridge, Mass., 1984). Studies of industrial design that use class as a category of analysis include Forty (n. 4 above) and David Gartman, *Auto Opium: A Social History of*

other designers defined the middle of the market broadly, but focused their attention on the preferences of one segment: white, middle-class women with young children, married to men in white-collar jobs, living in single-family homes.¹¹ Their choices embodied particular ideas about modernity, beauty, economy, hygiene, and household provisioning. Their preferences—as interpreted by designers, engineers, home economists, and other groups—formed the image of the servantless housewife and were the source of design standards for the entire product line of refrigerators.

This case study has two implications for our understanding of the relationship between household technology and a consumer society. On one level, it asks us to take styling seriously as part of a gendered interaction of technology, work, and social relations that sheds light on women's changing role as modern homemakers.¹² More broadly, it reveals the way that design standards for mass production visually reflect social norms and reinforce particular conceptions of the social order—in this case, a model of social integration based on an expanding middle-class mass market. Together these issues suggest why refrigerators, and by extension the streamlined kitchen, became such a compelling and contentious symbol of a modern American standard of living.¹³

American Automobile Design (London, 1994). For a Canadian example of industrial design as a tug-of-war between male designers and female consumers, see Parr (n. 1 above), 199–266.

11. On the expansion of the white-collar middle class, see Olivier Zunz, *Making America Corporate, 1870–1920* (Chicago, 1990). On middle-class values during the Great Depression, see Daniel Horowitz, *The Morality of Spending: Attitudes toward the Consumer Society in America, 1875–1940* (Baltimore, 1985), chap. 8; Warren I. Susman, *Culture as History: The Transformation of American Society in the Twentieth Century* (New York, 1984), 184–210.

12. On the implications of these gendered hierarchies for understanding technology, see Nina E. Lerman, Arwen Palmer Mohun, and Ruth Oldenziel, "Versatile Tools: Gender Analysis and the History of Technology," *Technology and Culture* 38 (1997): 1–8; Wajcman, *Feminism Confronts Technology* (n. 2 above). On the gendered hierarchies in the cultural construction of modernism, consumption, style, and design, see Marchand, 66–69, chap. 5; de Grazia, *The Sex of Things* (n. 4 above); Cheryl Buckley, "Made in Patriarchy: Towards a Feminist Analysis of Women and Design," *Design Issues* 3 (fall 1986): 3–15; Alison J. Clarke, *Tupperware: The Promise of Plastic in 1950s America* (Washington, D.C., 1999); Christopher Reed, ed., *Not at Home: The Suppression of Domesticity in Modern Art and Architecture* (New York, 1996); Penny Sparke, *As Long as It's Pink: The Sexual Politics of Taste* (London, 1995).

13. For conceptualizations of this model of integration around a broad middle-class standard, see Zunz, *Why the American Century?*; de Grazia, *The Sex of Things*, 1–24, 151–61, 275–86; Berolzheimer (n. 7 above). For competition to define this middle-class mass consumption, see de Grazia and Cohen. The social implications of the streamlined kitchen are explored further in Nickles (n. 2 above), chap. 4. The kitchen as symbol of an American standard of living for a middle-class society was articulated by Richard Nixon; see Elaine Tyler May, *Homeward Bound: American Families in the Cold War* (New York, 1988), 16–19, 162–65.

Locating the Average

The achievement of a basic level of performance in mechanical refrigerators led to new competitive pressures in the early 1930s, and manufacturers puzzled over how to attract a mass market. Even the leading producer, Frigidaire, a division of General Motors, felt the effects of this uncertain environment. In 1935 Frigidaire hired a new advertising agency, Lord and Thomas, to help them understand and navigate the new market. Lord and Thomas eventually produced an extensive, two-volume study, a remarkable document that rewards examination.¹⁴ The report articulates two competing visions of the social structure of the market, and in doing so it illuminates the larger dynamics of the refrigerator industry at mid-decade. It shows how domestic technology and the consumer were being redefined based on a reconceptualization of the market in terms of numerous socioeconomic strata and a white, middle-class, average. Most important, in place of a top-down model of cultural diffusion it offered a model of social integration based on an expanding middle, at the center of which was the servantless housewife.

Lord and Thomas argued that Frigidaire's conception of its market was based on a view of American society that had been very common among manufacturers but was now, in the agency's view, outdated. Manufacturers tended to focus on the reasons consumers "should" want a product rather than investigating the actual composition of the market. As a result, Frigidaire viewed the population of the United States as artificially divided into two horizontal groups: "class" and "mass". Like many companies, it assumed that the highest-income minority of the population, the "so-called prestige" group that included the upper-middle and upper class, constituted a "select market for practically all products." Accordingly, Frigidaire tended to aim advertisements and products at this group.¹⁵

The company meanwhile ignored the mass, the vast majority of the population. This group included a variety of middle- and lower-income occupations, from clerks and teachers to farmers and factory workers. While

14. "History (General) Histories: Frigidaire (by Shellworth)," Frigidaire Collection, box 3, folder 79-10.1-37, Scharchburg Archives, Kettering University, Flint, Michigan (hereafter Frigidaire/Kettering), 21. Frigidaire had the greatest market share of all manufacturers, though its share decreased from 29.2 percent in 1934 to 26.6 percent in 1935 after increasing steadily since 1932. "Leading Manufacturers' Percentage of Total Refrigerators Bought Each Year," in Lord and Thomas agency, "Phase 2 in a Problem of Mass Market Penetration, 1936," vol. 1 of the two-volume report titled "Frigidaire," box 7, folder 79-10.1-95, Frigidaire/Kettering. The early history of Frigidaire is documented in "Report on Frigidaire's Development," 1 February 1950, box 3, folder 79-10.1-41, Frigidaire/Kettering.

15. Lord and Thomas, "Phase 2 in a Problem of Mass Market Penetration," A2, A12-13. For advertisers' role in the debate over the limits to consumer citizenship in the 1930s, see Marchand (n. 7 above), 52-87.

some historians have argued that corporations such as Frigidaire tried to promote a consumption ethic among workers, the Lord and Thomas report suggests that Frigidaire ignored their existence.¹⁶ The agency argued that manufacturers were wrong to assume that refrigerator sales derived only from the elite group, which they calculated to be at most 20 percent of the population. Manufacturers overlooked the fact that “when you have sold four million of anything, as Frigidaire has, and with say 7,500,000 electric refrigerators in use, it is obvious that somebody else besides the [upper] classes are buying them.” Purchasing data indicated that the various income and occupation groups could not be neatly divided into two groups, but were more accurately located along a vertical continuum, stratified by purchasing ability.¹⁷

Lord and Thomas were not simply suggesting that Frigidaire consider the majority of the population as potential purchasers. They were suggesting that Frigidaire revise its traditional conception of American society—from a horizontal dichotomy, mass versus class, to a vertical model, a segmented pyramid in which consumers came from all levels. The agency argued that to achieve continued growth Frigidaire had to reconceptualize its market, as Alfred Sloan, of Frigidaire’s parent company General Motors, had forced the automobile industry to do in the previous decade.¹⁸

The advertisers knew they were going against received wisdom. They offered hundreds of pages of evidence regarding purchasing behavior in

16. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” A-12-13. For interpretations that stress hegemony, see Stuart Ewen, *Captains of Consciousness: Advertising and the Social Roots of the Consumer Culture* (New York, 1976); Gartman (n. 10 above).

17. Lord and Thomas, “Engineering the Advertisements,” vol. 2 of “Frigidaire,” C-2, box 7, folder 79-10.1-96, Frigidaire/Kettering. Statistics contained in Haring (n. 3 above) suggest a number closer to 6.5 million. For purchasing data, see Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” A-12-13 and chart “Refrigerator Ownership by Vocations”; “Engineering the Advertisements,” D-49.

18. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” A-28-29; “Engineering the Advertisements,” D-49. Frigidaire’s perception corresponded to the two-class scheme in Robert S. Lynd and Helen Merrell Lynd, *Middletown: A Study in Modern American Culture* (New York, 1929; reprint, New York, 1956), whereas Lord and Thomas’s segmented pyramid corresponds to the scheme in William Lloyd Warner and Paul S. Lunt, *The Social Life of a Modern Community* (New Haven, Conn., 1941), and the stratification school of sociology. On these two different social schemes generally, see Olivier Zunz, “Class,” in *Encyclopedia of the United States in the Twentieth Century*, ed. Stanley I. Kutler (New York, 1996), 202. On class and mass markets, see Lizabeth Cohen, “The Class Experience of Mass Consumption,” in *The Power of Culture: Critical Essays in American History*, ed. Richard Wightman Fox and T. J. Jackson Lears (Chicago, 1993), 135–62. On Sloan’s reconceptualizing of the social structure of the market, see Alfred P. Sloan, *My Years With General Motors*, ed. John McDonald and Catherine Steven (New York, 1963; reprint, New York, 1990), 163; Daniel Boorstin, *The Americans: The Democratic Experience* (New York, 1973), 552–55; “A New Kind of Car Market,” *Fortune*, September 1953, 224.

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cities, suburbs, and towns across the United States, culled from three major sources: consumer research, analysis of competition, and retailers. They painted a picture of consumer purchasing based in a domestic context of particular social groups and family needs. They concluded that the relationship between income and price paid for a refrigerator was unpredictable. Large working-class families might purchase a larger refrigerator than a wealthier family. Furthermore, to the moderate-income family the kitchen was “one of the most important parts of their existence,” whereas it was “something remote” to the wealthiest Americans.¹⁹ The kitchen was a traditional social space for the working-class family, and was becoming more important to the middle-class housewife who could no longer afford servants, whereas family members of wealthy households with servants rarely entered the kitchen.²⁰

Surveys conducted by Lord and Thomas indicated not only the existence of a broader market but also its significance. With a majority of elite households surveyed already owning mechanical refrigerators, future growth had to come from middle- and lower-income households. In fact, that agency’s analysis of recent sales showed that the percentage of refrigerators purchased was increasing for these groups and decreasing for elite consumers. Frigidaire dismissed many people as prospects because of their low incomes, but the fact that the same people owned cars signalled their potential as consumers.²¹ Such biases had serious consequences. They left the “field . . . ripe for picking” by new competitors, such as Sears.²² The agency warned that loss of business was a “high price to pay for elegance.”²³

Lord and Thomas’s answer to the “problem of mass market penetration” was to aim advertising appeals “vertically and deeply.” All but the poorest social groups along the economic ladder—from “Fifth Avenue” to

19. The most extensive survey data focused on the midwest. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” A-22, A-27, A-49, A-81, B-2, chart “Percentage of Each Group Buying Various Sizes of Refrigerators.” For a more extensive analysis of the data in this report, see Nickles (n. 2 above), 95–109.

20. On the kitchen as a working-class social and multipurpose space, see Harvey Green, *The Uncertainty of Everyday Life, 1915–45* (New York, 1992), 63, 98; Gwendolyn Wright, *Building the Dream: A Social History of Housing in America* (New York, 1981), 124–25; Barbara M. Kelly, *Expanding the American Dream: Building and Rebuilding Levittown* (Albany, N.Y., 1993), 135.

21. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration” (n. 14 above), A-71, “Percentage of the Refrigerators in Various Price Classes Purchased Each Year By Each Group, 1933–35.” For car ownership, B-14.

22. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” B-17 (quote), A-68, A-75, A-77, B-21–22, B-27, charts “Percent of Each Group Owning Various Makes of Refrigerators” and “Leading Manufacturers’ Percentage of Total Refrigerators Bought Each Year.” On the marketing of refrigerators by Sears during this period, see Tedlow (n. 6 above), 305–28.

23. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” B-27; “Engineering the Advertisements” (n. 17 above), C-3.

“shirt sleeve” to “wage earner”—must be seen as potential consumers. The advertisers argued that aiming at the top of the social pyramid, which had been standard advertising practice, alienated wage earners. But although it emphasized the importance of consumers at the base of the pyramid, the agency did not suggest that Frigidaire focus its advertising on this group. Nor did it advocate tailoring advertisements to each different level. Instead, it argued that Frigidaire could create a “universal” appeal by aiming at the middle.²⁴

This was a vertical scheme that invented an average as the basis for advertising and products. To attract the masses without alienating the classes, the advertisements “must be middle class.” The agency recommended that the company’s refrigerator advertisements convey a “middle-class homeliness” and “strike a mean of the market” in order to attract the largest possible audience. This meant that advertisements should no longer feature “the two-yacht family” but rather should show “ordinary” middle-class people.²⁵ Early advertisements emphasized the novelty of chilled foods and entertaining, but average consumers were interested in economy of price and operation. Therefore, a middle-class advertisement aimed at ordinary folks should focus on the ways that Frigidaires saved money by using electric current economically and preserving food.²⁶

This strategy of aiming at an average and defining that average as middle class acknowledged the importance of the middle-class market for refrigerators in the 1930s. The wealthy were too few to form a national market, while working-class consumers as a group did not yet have sufficient purchasing power. But the report also reflected a conception of society based on social integration around the average rather than either top-down cultural diffusion or diversity; market penetration came from “the middle-class down and perhaps also up.”²⁷

24. Lord and Thomas, “Engineering the Advertisements,” C-3, D-49; “Phase 2 in a Problem of Mass Market Penetration,” A-28.

25. Lord and Thomas, “Engineering the Advertisements” C-1, D-23.

26. This description of early advertisements is based on ads culled from a sample of several magazines from the 1920s in the collection of the Winterthur Museum and Library, Winterthur, Delaware, including *House and Garden* and *McCall's*. See also Bradley; Grahame, 289–91; and Nye, 240–68 (all n. 5 above). By the time of this Lord and Thomas report, the shift in advertising themes was already underway. For surveys indicating that the “average” consumer was interested in economy, see Lord and Thomas, “Engineering the Advertisements,” chart “Excerpts from Your Research Department,” C. E. Sundberg Co. interview, and L. Fish Furniture Co. interview. Lord and Thomas, “It's all Greek to Me,” advertisement, *Fortune*, April 1936, 173. A campaign clearly influenced by Frigidaire retailers’ position that ads should aim at the ordinary rather than the prestige household was the highly successful “Meter Miser” campaign, intended to convey the idea of savings in electric current achieved with the Frigidaire compressor; see “Electric Servants,” *Printers' Ink Monthly* 35 (August 1937): 85–86. For another perspective on this ad, see Marchand (n. 7 above), 349–50.

27. Lord and Thomas, “Engineering the Advertisements,” C-3.

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Lord and Thomas also argued that winning the loyalty of this average consumer meant going beyond advertising strategies to the design of the refrigerator itself.²⁸ Again, they did not suggest tailoring refrigerator designs to the needs of different groups. Rather, the agency recommended that Frigidaire determine the size and design most desired by the average consumer and use it to create a standard for the entire product line. Refrigerator models would then be differentiated by price and features, as consumers “stepped-up” from the “stripped” or “nude” models. The average refrigerator would be featured in the company’s advertising and would provide the basis for future styling and model changes.²⁹

Through the lens of one advertising agency and one manufacturer, the Lord and Thomas report illuminates ongoing struggles to define the potential refrigerator market. Having made the case for the middle-class woman, broadly conceived, as the average consumer, it remained to create a design standard that reflected her preferences. Implementing product design strategies for mass-produced goods aimed at an average American woman was difficult and costly. Market research and annual styling changes attempted to reduce the risk and bridge the distance between male designers and female homemakers.

From Cleanlining to Streamlining

In the late 1920s, refrigerator manufacturers began producing their own steel cabinets, rather than purchasing wooden cabinets from icebox makers or selling the refrigerator unit separately, and as they did they also began to modify refrigerator designs.³⁰ These changes reflected an attempt

28. The design features in the 1936 line are the same ones emphasized in the report, indicating that Frigidaire probably took suggestions from retailers to heart when redesigning that line. Lord and Thomas, “Engineering the Advertisements,” s.v. “Miscellaneous,” “Excerpts from Your Research Dept.” and p. C-23-24. A 1936 report credited the 4.8 percent increase in sales over the previous year partly to “the attractiveness of the Frigidaire cabinets, with their wider, roomier appearance.” See “This report covering the Frigidaire Household Business is submitted to General Motors’ Executive Committee in accordance with Mr. Sloan’s letter #552,” 1936, box 4, folder 79-10.1-52, Frigidaire/Kettering.

29. Lord and Thomas, “Phase 2 in a Problem of Mass Market Penetration,” A-79, B-18. The Lord and Thomas surveys asked retailers if they could have “only one refrigerator . . . what would it be?” Lord and Thomas, “Engineering the Advertisements” (n. 17 above), s.vv. “Miscellaneous,” “Excerpts from Your Research Dept.”, and p. C-23-24. The survey results occasionally referenced ethnic groups, nonwhites, and regional distinctions. For the different patterns of refrigerator ownership by region and race in the 1930s, see Berolzheimer (n. 7 above), 151.

30. Refrigerator cabinets generally had adopted the form of iceboxes, which were wooden boxes with heavy hardware. LaFrance, “Refrigerators Began to Sell after 1913,” 118–19; Anderson (all n. 5 above), 214. “That Refrigeration Boom,” *Fortune*, December 1943, 63.

to redefine the mechanical refrigerator from a novelty for the wealthy to an efficient, economical food preservation and family welfare tool for the servantless housewife. Refrigerator cabinet design began to draw on concerns articulated by home economists, who focused on a middle-class audience. In particular, home economists spread the message that improper food storage posed dangers to health.³¹ By preserving food properly, advertisements claimed, housewives safeguarded “the health of the household.”³² Refrigerator design began to visually articulate such concerns through use of the color white, which progressive reformers associated with hygiene, for steel exteriors and nonporous interior surfaces. Early finishes had a tendency to yellow, but the pursuit of “sparkling whiteness” eventually yielded DuPont “Dulux” refrigerator finish in the mid-1930s.³³

The refrigerator’s primary function, preserving food, was now linked visually to the responsibilities of the average housewife to provide a clean, safe environment for her family. Contrasting to diverse, localized practices of food preservation and wooden iceboxes kept in service areas and used primarily by servants, these white, steel refrigerators were conceptualized as part of the ordinary kitchen. By buying a white refrigerator and keeping it in the kitchen, the housewife expressed her awareness of modern sanitary and food preservation standards; her ability to keep the refrigerator white and devoid of dirt represented the extent to which she met these standards.³⁴

As the depression began, home economists and other commentators joined these family health issues to new economic concerns that further defined the relationship between the development of refrigerator design and modern standards. The popular press focused on women’s homemaking duties as a way to stabilize not only the economic crisis but also a social one that threatened to undermine traditional gender roles. Eleanor Roosevelt noted that women could help their families and the nation by being thrifty and modern homemakers, studying “all the latest suggestions” in order to provide nutritious meals.³⁵ The dual pressures to economize by “making do” and to meet modern standards meant more work, and adver-

31. Carolyn M. Goldstein, “Mediating Consumption: Home Economics and American Consumers, 1900–1940” (Ph.D. diss., University of Delaware, 1994), 142–77. See also Nancy Tomes, “Spreading the Germ Theory,” and Lisa Mae Robinson, “Safeguarded by Your Refrigerator: Mary Engle Pennington’s Struggle with the National Association of Ice Industries,” in Stage and Vincenti (n. 7 above).

32. Dameron (n. 7 above), 296–305.

33. Van Doren (n. 6 above), 2–3. On Dulux, see E. A. Sampson, “Preserving Food in 7,000,000 Homes,” *Du Pont* 30 (midsummer 1936): 14.

34. On the standardization of refrigeration devices and their location in the home as contributing to a standardization of formerly local and distinctive food preservation practices, see Grahame (n. 5 above), 301–3. On the significance of whiteness, see Gwendolyn Wright, *Moralism and the Model Home: Domestic Architecture and Cultural Conflict in Chicago, 1873–1913* (Chicago, 1980), 120; Forty (n. 4 above), 244–45.

35. Sherrie A. Inness, *Dinner Roles: American Women and Culinary Culture* (Iowa City, 2001), 115, citing Eleanor Roosevelt, *It’s Up to The Women* (New York, 1933).

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tisements and women's magazines defined refrigerators as the economical and laborsaving solution. Refrigerators allowed homemakers to save by buying in bulk, eliminated trips to the grocery store, and encouraged the use of leftovers.³⁶ By 1933, home economists were recommending six cubic feet of refrigerator storage as the standard for "the average family." They also made suggestions for interior design based not only on the scientifically correct arrangement of food but also on the perceived needs of the typical housewife, who preserved milk, meat, and vegetables not produced by the household and who made decisions based on efficiency and economy.³⁷ These standards were more difficult for working-class and rural families, without refrigerators and with differing family survival strategies, to meet.³⁸

Yet design standards for appliances remained in flux, caught between these new social considerations, an engineering perspective focused on the refrigerator as a machine, and ideas inherited from the icebox era. This tension was most apparent in the General Electric monitor-top refrigerator. The name referred to the placement of the compressor on top of the refrigerator for maximum operating efficiency, which made the refrigerator somewhat resemble the Civil War ironclad USS *Monitor*. The heavy, squat proportions and massive hardware remained from the design vocabulary of the icebox (fig. 3), and the design emphasized the refrigerator's mechanical function.³⁹

As manufacturers adopted mass-production methods, tooling costs created a powerful disincentive to variety. Whereas household furnishings

36. See Dameron, 296–305; Inness, 77.

37. Christine Holbrook, ed., *My Better Homes and Gardens Home Guide* (Des Moines, Iowa, 1933), 97, 105; Goldstein, "Mediating Consumption" (n. 31 above), 154–55, 169, 175–76, 177. The most commonly purchased size was four cubic feet. See Lord and Thomas, "Phase 2 in a Problem of Mass Market Penetration," chart "Percentage of Each Group Buying Various Sizes of Refrigerators."

38. On women and class values, see Winifred D. Wandersee, *Women's Work and Family Values through Prosperity and Depression* (Cambridge, Mass., 1981); Alice Kessler-Harris, "Gender Ideology in Historical Reconstruction: A Case Study from the 1930s," *Gender and History* 1 (1989): 31–49. On the middle class, see Horowitz, also Susman, 184–210 (both n. 11 above). On working-class (as distinct from middle-class) domestic economy and values during the Great Depression, see Lizabeth A. Cohen, *Making a New Deal: Industrial Workers in Chicago, 1919–1939* (New York, 1990), 213–49; Susan Porter Benson, "Living on the Margin: Working-Class Marriages and Family Survival Strategies in the United States, 1919–1941," in de Grazia, *The Sex of Things* (n. 4 above), 212–43. On rural families, see Katherine Jellison, *Entitled to Power: Farm Women and Technology, 1919–1963* (Chapel Hill, N.C., 1993). On the tension between consumption and thrift during the depression generally, see Susan Strasser, *Waste and Want: A Social History of Trash* (New York, 1999), 202–27; Inness, 109–23. On the elevation in importance of women's role in the home as housekeeper and cook during the depression, see Harvey Levenstein, *Paradox of Plenty: A Social History of Eating in Modern America* (New York, 1993), 31.

39. Meikle (n. 10 above), 103.

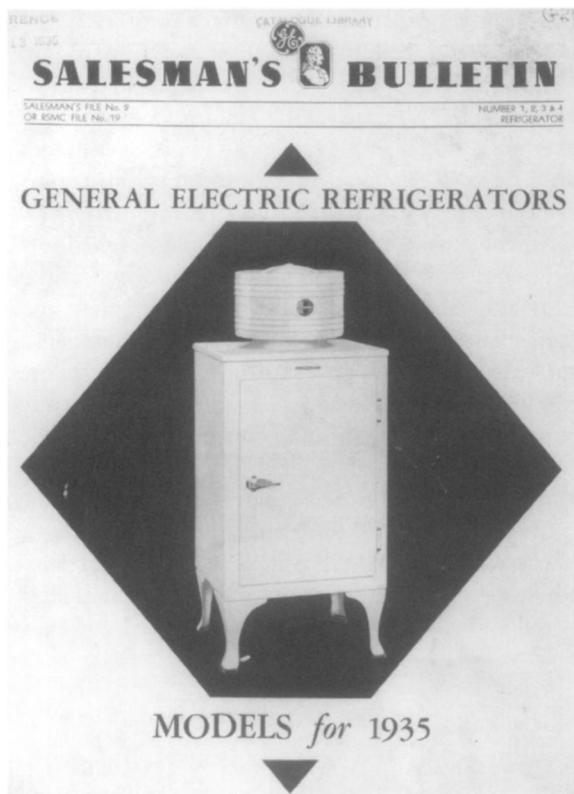


FIG. 3 By the mid-1930s, General Electric had restyled the monitor-top refrigerator by minimizing the formerly heavy hardware and streamlining the compressor case on top, but women complained about the mechanical look and inconvenience of the design. (General Electric Co., *Salesman's Bulletin*, pamphlet, 1935, Trade Catalog Collection, Smithsonian Institution Libraries, National Museum of American History Branch, Washington, D.C. Courtesy Smithsonian Institution Libraries.)

catered to an endless diversity of tastes, mass production demanded standardization. Manufacturers hired industrial designers as a competitive strategy to create design standards that would appeal to a growing market.⁴⁰

40. On the development of industrial design in this period, see Meikle; Nickles (n. 2 above), chap. 1. On the development of consumer culture, see Richard Wightman Fox and T. J. Jackson Lears, eds. *The Culture of Consumption: Critical Essays in American History, 1880–1980* (New York, 1983); William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York, 1993); T. J. Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (New York, 1994). On developing design standards for mass production, see Nash, 19–25, and Heskett (both n. 9 above). On refrigerators

By the mid-1930s, the design of refrigerators and other household equipment would be transformed by the new, modernist, "streamline" aesthetic. Historians have tended to emphasize the dramatic quality of this change, as did industrial designers themselves. Therefore, consumers' rapid acceptance of streamline modernism has seemed remarkable. But, as the foregoing discussion illustrates, household economists and other reformers already had succeeded in simplifying refrigerator design by calling on values such as hygiene and efficiency. What designers contributed was a new aesthetic vocabulary and rationale.⁴¹ In addition, though these male designers tried to impose their elite, modernist tastes, they quickly learned that consumers viewed both the fanciful French *art moderne* and the severe International Style modernism as inappropriate for many domestic goods. Designers found a visual vocabulary that expressed modernity but, just as significantly, was restrained within the boundaries of household values as they were being defined through the role of the servantless housewife.⁴²

Lurelle Guild's work in the 1930s reveals how streamlining as a design standard in kitchen appliances was mediated.⁴³ Guild and other designers developed these standards in the context of a flurry of market research studies conducted by advertisers, magazines, and manufacturers.⁴⁴ These studies generally concluded that the "great market for every appliance

tor manufacturing techniques as they developed over the decade, see Van Doren and "Refrigerators on the Line" (both n. 6 above). On differences in production modes, see Scranton, "Manufacturing Diversity" (n. 9 above), 476–505. On the home furnishings industries, see Philip Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865–1925* (Princeton, N.J., 1997); Regina Lee Blaszczyk, *Imagining Consumers: Design and Innovation from Wedgwood to Corning* (Baltimore, 2000). On mass production, see Hounshell (n. 9 above).

41. A similar point about streamlining as a continuation of earlier design ideas is made by LaFrance (n. 5 above), 28, and Forty (n. 4 above), 156–81. On designers' self-promotion, see Meikle.

42. See Nickles, 23–89. Cultural historians have tended to view styling as fostering new values based on irrational and wasteful consumption. See Lupton and Miller (n. 4 above); Stuart Ewen, *All-Consuming Images: The Politics of Style in Contemporary Culture* (New York, 1988); Gartman (n. 10 above). Alternatively, on the ways in which consumption choices and uses reflect the moral economy of the household, see Roger Silverstone, Eric Hirsch, and David Morley, "Information and Communication Technologies and the Moral Economy of the Household," in *Consuming Technologies: Media and Information in Domestic Spaces*, ed. Roger Silverstone and Eric Hirsch (London, 1992), 15–31. See also Parr (n. 1 above); Clarke (n. 12 above).

43. On Guild, see "Both Fish and Fowl," *Fortune*, February 1934, 40–43, 90; E. F. Lougee, "From Old to New With Lurelle Guild," *Modern Plastics* 12 (March 1935): 14–15; "Designer for Mass Production," *Art and Industry* 24 (June 1938): 228–33; Francis Sill Wickware, "Durable Goods Go to Town," *Forbes*, 15 November 1936, 32, 35.

44. On this dual use of market research, see Roland Marchand, *Creating the Corporate Soul: The Rise of Public Relations and Corporate Imagery in American Big Business* (Berkeley, Calif., 1998).

would appear to be the people in the so-called middle class." Loosely defined in terms of income and occupation, in practice their conception of the market was weighted toward the white-collar middle class. For example, one study characterized it broadly as comprising households with incomes between two thousand and ten thousand dollars, suggesting that this represented a majority of families, when in fact median household income at the time was less than two thousand dollars. A Westinghouse study made this focus explicit. It defined the average family as one living in a single-family home, with two children, without servants, in and around a northern city, suburb, or town.⁴⁵

An early field survey conducted by Guild shows how designers contributed to the construction of the average. Guild was introduced to refrigerator manufacturers by advertising agency personnel, but these contacts did not bear fruit immediately.⁴⁶ To convince manufacturers of their need of his services, Guild conducted his own consumer survey. Typically, designers conducted such surveys by selecting a geographic area, such as a city, and attempting to get a representative sample of the population there. But they tended to venture into neighborhoods with single-family homes, which created a bias toward suburban areas and lifestyles. And although they did include wives of salesmen, skilled mechanics, and other families of more modest income, their surveys tended to favor the upper-middle class. Guild took scale drawings and models of current and proposed designs and knocked on the doors of five hundred women in several East Coast cities and suburbs, from White Plains, New York, to Richmond, Virginia. He selected what he believed was a representative, random sample, interviewing a few poorer women and a few wealthy ones, but mostly middle-class women. Since the samples were weighted toward the middle class, the opinions expressed by the majority of the women in his sample reflected an average, middle-class consumer. Their tastes then served as the basis for the

45. See Dameron (n. 7 above), for quote, 9, and analysis of surveys and general assumptions. For the Westinghouse survey, see R. E. Imhoff, "Why They Buy," *Electrical Merchandising* 53 (January 1935): 15, 48, which also stated the assumption that the south was considered "abnormal" because of the climate and availability of African-American servants. Surveys were usually weighted toward the northern United States, though some studies included the south. See also "Electric Servants" (n. 26 above) for another Westinghouse survey, 80–82. Median income was \$1,245 in 1934–36, according to Berolzheimer (n. 7 above).

46. In 1931, Frigidaire's former advertising agency, the Geyer company, contacted Lurelle Guild and other designers to submit proposals for the styling of refrigerator cabinets. W. P. Lloyd to Lurelle Guild, 4 January 1931, box 7, folder "Frigidaire", Lurelle Guild Papers, Department of Special Collections, Syracuse University Library, Syracuse, New York (hereafter Guild Papers). Frigidaire and General Motors representatives preferred the designs of an unnamed consultant. E. B. Newill to Lurelle Guild, 30 June, 1931, box 7, folder "Frigidaire", Guild Papers.

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design standard, which determined how value would be expressed throughout the entire refrigerator line.⁴⁷ Guild's and other designers' unscientific methods created an insular process, in which the presumption of a middle-class market led to surveys weighted toward middle-class consumers whose answers naturally reinforced the original assumptions of the survey.⁴⁸

Guild had an opportunity to translate his survey findings into design when he was hired as a consultant by the Norge Corporation, makers of electric refrigerators.⁴⁹ Howard Blood, president of Norge, expressed his belief that several refrigerator makers had achieved a basic level of "performance efficiency" by 1931. The way to gain a competitive edge was to create distinction through styling.⁵⁰ Guild based his design for Norge on his own survey results, as well as on results of additional surveys of women conducted by the company. Blood claimed that the 1933 models designed by Guild "closely" followed "the desires" of the women surveyed, based on a "percentage analysis" of preferences expressed. The results of that analysis showed that women were concerned with the interior as much as the exterior, with features as much as aesthetics. Their main considerations were ease of cleaning, simplicity, efficiency, and convenience in the interior arrangement. Though publicity tended to exaggerate the extent to which

47. Lurelle Guild to William Reynolds, 29 April 1932, and "Electrolux Refrigerator Sales, Inc.", 29 April 1932, both in box 17, folder "Servel (Electrolux) 1934-36", Guild Papers. Guild approached Servel with his survey, probably after he had contacted Norge but before they decided to commission him. Guild was rejected by Servel at this time.

48. On other designers' use of surveys in the early 1930s, see Norman Bel Geddes, *Horizons* (Boston, 1932); surveys and correspondence in "Standard Gas Equipment Stove" (job file no. 267), box 14, folder "SGE Stove Research-Gas Stove Survey—Dealers", Norman Bel Geddes Papers, Theatre Arts Collection, Harry Ransom Humanities Research Center, University of Texas at Austin (hereafter Geddes Papers). On manufacturers' surveys, see the Westinghouse surveys referred to in "Electric Servants," 80. See Marchand, *Advertising the American Dream* (n. 7 above), 76, regarding the "slapdash" methods of consumer research in many corporations in the late 1920s. On middle-class suburban development between the wars, see Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York, 1985), 172-89.

49. See correspondence in box 14, folder "Norge #2", Guild Papers. Guild wrote that with Norge, Guild's firm was "called in at the last moment when the deadline for starting production" was near. Lurelle Guild to E. F. Copp, 18 February 1933, box 5, folder 9/18/32-12/30/33, Guild Papers.

50. Howard Blood, "Redesign: What It Means to the Comeback Process," *Printers Ink*, 30 March 1933, 72-73. Blood was an engineer and had been "head of the General Motors plant in Canada"; Guild to E. F. Copp, 18 February 1933. The fact that total sales of mechanical refrigerators dropped in 1932 no doubt gave manufacturers an additional impetus to hire outside consultants. Total sales rose again in 1933 to a new high and continued to rise until World War II, with the exception of a drop in the years from 1937 to 1938. See Tedlow (n. 6 above), 314, 321.

these women “designed” the refrigerators, the attention given to these surveys suggests that they were taken seriously.⁵¹

What designers such as Guild contributed was the linking of aesthetic precepts to domestic values and functional concerns. Guild argued that achieving design goals in an attractive way was important, since the servantless housewife spent much time in the kitchen.⁵² He eliminated elements associated with the icebox, such as the protruding cabinet cover and heavy hardware. The result was a step toward streamlining through simplification of the exterior and curved surfaces, which suggested associations between ease of cleaning, hygiene, convenience, and a particular conception of modernity.

These streamlined forms went hand in hand with new, more economical, and speedier manufacturing techniques (fig. 4). The refrigerator was constructed from pressed-steel panels, which reduced the number of cabinet components. The base was made from a single piece, rather than standing on separate legs. The side panels curved in to meet the front door and the top. This gave the refrigerator a smoother appearance, with fewer joints. Engineers also promoted the rounding of the corners, which made the metal work better in the dies.⁵³

Norge considered the new design a sales success after its introduction in 1933.⁵⁴ Indeed, the success of this design vocabulary was evidenced by simultaneous changes in competing refrigerator designs. Henry Dreyfuss's redesign of a recently introduced “flat-top” General Electric (GE) refrigerator in the “cleanlined” style, as he called it, was the most dramatic example.⁵⁵

51. Before Guild came on board, Norge queried twelve hundred women in a number of cities as to their preferences and sponsored an essay contest in major magazines. Howard E. Blood, “100,793 Women ‘Bossed’ Our 1933 Product Design Job,” *Sales Management*, 15 September 1933, 261, 293, and “Redesign: What It Means,” 69–74. The lack of design records and original surveys prohibits an evaluation of the company’s claims. On Norge survey results and the survey as a publicity tool, see also Lurelle Guild to Howard Blood, 9 March 1932, box 14, folder “Norge #2”, and “100,793 Women Select Norge Design: Lurelle Guild, Famous Designer, Interprets Express Wish of Women,” *New York Herald*, 3 March 1934, clipping, box 14, folder “Publicity”, Guild Papers. On the controversy over these studies, see “Testing Industrial Design,” *Printers’ Ink*, 23 May 1935, 68–69.

52. Guild to Blood, 4 May 1932, box 14, folder “Norge #2”, Guild Papers.

53. Heskett (n. 9 above), 149; Van Doren (n. 6 above), 3. Van Doren attributes the change to curved side and top panels and the reduction in parts to Norge’s 1933 cabinets, designed by Guild. The files relating to Guild’s work for Norge do not reveal the nature of the relationship between the development of Guild’s design and these new manufacturing techniques. On the rounded corners, see Muffly (n. 6 above), 42.

54. Blood, “Redesign: What It Means,” 72–73. Norge had the third largest market share by 1938. Haring (n. 3 above), 36.

55. Norman Bel Geddes had been hired by GE as consultant as early as 1930. According to Geddes, he had recommended the elimination of the monitor-top, but this

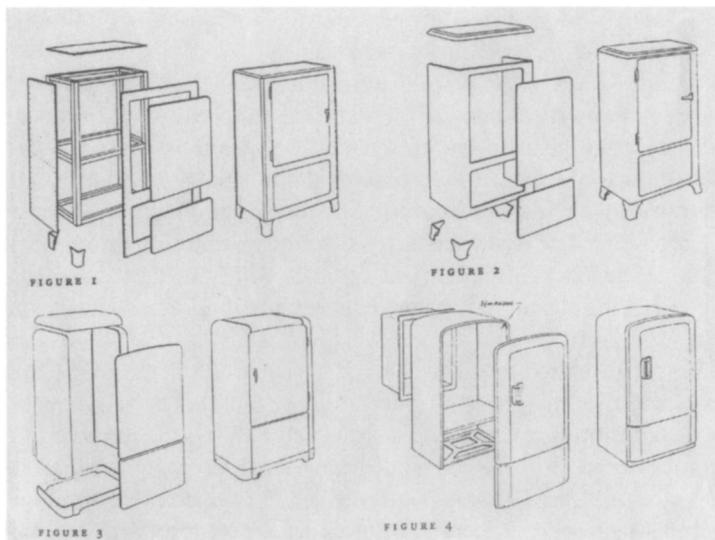


FIG. 4 Developments in refrigerator assembly. Guild's design for Norge in 1933 (no. 3) used fewer components and achieved a smoother appearance. Manufacturers further streamlined forms (no. 4) by the end of the decade. (Harold Van Doren, "Streamlining: Fad or Function?" *Design* 1 [October 1949]: 2–5.)

Although designers such as Dreyfuss were credited with styling and design innovations, these new modern forms reflected concerns expressed by home economists about the needs of the average homemaker. General Electric had received complaints from consumers about the monitor-top model prior to the Dreyfuss design. In 1932, Mary Andrews, a GE employee, wrote to her supervisor relating the complaints she had heard from other women about the monitor-top and other GE products:

These are almost always criticisms not of the quality or engineering work of the products, but the points where the desires of the users have not been met. I mean by this that the women who buy and use these appliances make certain demands that often do not interest the engineers as much as they should, I think. I have heard from a number of friends the remark "Well, we would have bought a G.E. refriger-

was not accepted. Meikle (n. 10 above), 103. For Dreyfuss's use of the term "cleanlining," see Russell Flinchum, *Henry Dreyfuss, Industrial Designer: The Man in the Brown Suit* (New York, 1997), 43. Although it is generally assumed that Dreyfuss designed the first flat-top for GE, in fact GE had already introduced a flat-top in 1933. Dreyfuss's design simply created a new form for the deluxe flat-top; see General Electric, *The Joy of Living Electrically*, catalog, June 1933, 12–13, Hagley Museum and Library, Wilmington, Delaware; "New G-E Models Out," *Electric Kitchen Times*, 10 April 1934, 1.

ator but we didn't like that cooling coil on the top." And usually this is supplemented by saying that it is convenient to have shelf room at the top. These people would much rather *not* have the mechanical part of the device in evidence. . . . [I]t seems to me important that our engineers should realize that what interests them in such a product, that is, the machine itself, is the very thing that the woman buying it wants kept out of sight and out of mind.

Andrews pointed out that having the machinery exposed made the appliances difficult to clean. Contemporaries agreed that the monitor-top was more energy efficient. Andrews suggested a different definition of efficiency, one based in women's experiences as users. The recipient of the letter forwarded it to Gerard Swope, president of GE, with the note that "it seems to me that there is food for thought" in her comments. The next year, GE came out with a flat-top model. The company also continued to produce the monitor-top for several years, indicating that making such changes was never easy.⁵⁶

The Sears Coldspot refrigerator, designed by Raymond Loewy and introduced in 1935, demonstrated most dramatically consumer acceptance of the new streamlined form.⁵⁷ The Coldspot cost less than other brands, but consumer surveys also confirmed the popularity of the design. In one survey (fig. 5), consumers approvingly recognized the Coldspot as "streamlined," and voted the monitor-top "the most disliked of all shapes." The lesson was that "price and appearance appeal to anybody."⁵⁸

Streamlining succeeded only after designers modified modernism from the avant-garde to the average. Streamlining, as employed in household appliances, was modern in that the forms rejected domesticity as that was historically constructed; refrigerators were not decorated with applied ornament derived from aristocratic models. European avant-garde modernists, typified by the Bauhaus, had sought to apply the functionalist design logic of the engineer, gendered male, to the design of the domestic sphere. The GE monitor-top expressed its function as a modern machine most directly. But streamlined refrigerators were obviously styled, as evidenced by their purposeful concealment of machinery, sensuous curves, and precious surfaces. By applying the aerodynamic design vocabulary of

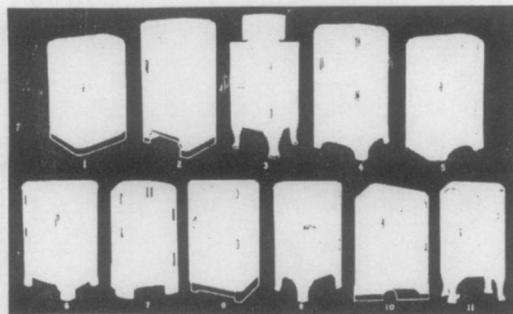
56. Mary Andrews to W. D. Coolidge, 16 August 1932, and W. D. Coolidge to Gerard Swope, 18 August 1932, both in folder "Suggestions, 1931–," General Electric, Gerard Swope Papers, Schenectady Museum Archives, Schenectady, New York. I am grateful to the late Roland Marchand for bringing this letter to my attention. On the efficiency of the monitor-top, see "Electric Servants" (n. 26 above), 86; Muffy, 40.

57. Meikle, 104–6; "History of Coldspot," 1939, Sears, Roebuck and Co. archives, Hoffman Estates, Illinois.

58. Lord and Thomas, "Phase 2 in a Problem of Mass Market Penetration" (n. 14 above), chart "Results of Two Consumer Jury Tests on Refrigerator Appearance," B-18-19, B-21-22.

Results of Two Consumer Jury Tests on Refrigerator Appearance

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Refrigerator No.	Number of Votes For:			
	1 ST PLACE	2 ND PLACE	3 RD PLACE	POOREST
1.	90	35	33	42
2.	18	20	18	3
3.	6	10	7	195
4.	45	36	32	5
5.	11	27	43	6
6.	5	15	30	2
7.	49	42	34	7
8.	18	34	27	12
9.	33	40	26	5
10.	2	18	13	16
11.	39	37	53	18

Lord & Thomas Survey - Aug. 1935

FIG. 5 Lord and Thomas survey results, 1935. (Courtesy Schenckburg Archives, Kettering University, Flint, Michigan.)

transportation vehicles to stationary objects, streamlining contradicted functionalist principles.⁵⁹

Whereas the universal, functionalist precepts espoused by modernists aimed at the ideal man, streamlining's modernism aimed at the average

59. LaFrance (n. 5 above) makes this point about streamlining in terms of reconciling the "furniture" and "tool" traditions, although he does not apply a class or gender analysis. Sparke, *As Long as It's Pink* (n. 12 above), 138, argues that streamlining reconciled these conflicting spheres of production and domesticity through its "androgynous" aesthetic. Alfred Barr Jr., of the Museum of Modern Art, praised refrigerator design before streamlining, probably referring to the monitor top; Terry Smith, *Making the Modern: Industry, Art, and Design in America* (Chicago, 1993), 391.

woman. The modernist vocabulary of streamlined, white appliances linked the idea of appliances as laborsaving devices to the social idea of modern standards. The middle-class, servantless housewife now did much the same manual labor as her working-class counterpart. “Electric servants,” advertising suggested, allowed her to uphold modern standards and avoid becoming a “domestic drudge.” The relationship of the refrigerator to the physical status of the housewife and the social status of her family was expressed through modern but restrained streamlined styling.⁶⁰ This design language conflated smoothness, whiteness, cleanliness, and Americanism. At a time when the middle class may have feared slipping to working-class status, and when popular culture portrayed the working class, immigrants, and nonwhites as having lower standards of cleanliness, these streamlined appliances suggested that women could maintain themselves and their family’s standards through thrift and hygiene.⁶¹ To those fortunate working-class consumers who could afford refrigerators, the simple lines of streamlined refrigerators provided object lessons in taste, values, household provisioning, and housekeeping based on a modern standard. In this way, streamlining represented social integration around a broad middle-class norm.⁶²

Food for Thought: Opening the Refrigerator Door

By 1935, then, designers such as Lurelle Guild had established a new streamlined form based on a negotiation among engineering concerns, aesthetic ideals, and their conceptualization of a middle-class ethos. As industrial designers responded to household values and mass-production meth-

60. Advertisements often linked the housewife’s “beauty” to the beauty of modern, styled appliances. For example, see photo caption in *Electric Cookery Times*, 7 June 1932, 16; “A New Beauty Treatment For Your Kitchen . . . and for You,” *Electrical Merchandising* 59 (April 1938): 46–47. On the “proletarianization” of the middle-class housewife and household technology as a fault line separating middle- and working-class women, see Cowan, *More Work for Mother* (n. 4 above), 180–81; Bowden and Offer (n. 4 above), 244–74.

61. Meikle (n. 10 above), 103; Forty (n. 4 above), 146–81. An advertisement for a new *Time* market research report typified such assumptions about the working class. It asked: “Do lower bracket families use more [soap] because they get dirtier? Or do they use less because they don’t wash as often?” “How Do They Spend Their Incomes,” *Fortune*, March 1932, 28–29. For the racial connotations of this linkage between whiteness, hygiene, and Americanism, see “The Whitest White You Ever Saw,” [circa 1929–30], DuPont Advertising collection (Acc. 500), Hagley Museum and Library, Wilmington, Delaware. On an interpretation that stresses the eugenicist principles underlying the focus on the white, native-born “typical American family” in the 1930s, see Robert W. Rydell, *World of Fairs: The Century-of-Progress Expositions* (Chicago, 1993).

62. Forty, 170, called the refrigerator an “object lesson” in cleanliness. See Kathleen Robertson, “Kitchen Pride,” *Electrical Merchandising* 54 (November 1935): 2–3, for the idea of these designed appliances as uplift.

ods by streamlining, refrigerators began to look more and more alike. Competition drove many small refrigerator makers out of business, furthering the trend to homogeneity. This standardization of appearance diminished the competitive advantage that design had conferred.⁶³

What kept industrial designers employed, then, was the belief that constant change was needed in order to remain competitive. As designs changed each year—always remaining within the basic parameters established by the streamlined form—the features and interior arrangement of the refrigerator took on more significance as bases for competition.⁶⁴ These features, many of which served to increase the price of the refrigerator, have been dismissed as “gadgets.”⁶⁵ But the interior plan and features of the refrigerator merit attention because they reveal additional assumptions about household labor, diets, and provisioning, and they reinforced these assumptions. In other words, rather than suggesting luxury or glamour, successful features had to conform to the moral economy of the typical depression household.⁶⁶ Manufacturers acknowledged the importance of the interior of the refrigerator to the homemaker by showing the refrigerator door open in many advertisements. These open refrigerators, stocked with food, were compelling images of abundance during harsh economic times.⁶⁷

By the mid-1930s, manufacturers had developed new features and established the basic interior arrangement of the refrigerator. Some manufacturers did not offer all features. The most common included multidirectional door handles; hydrator drawers for preserving vegetables; adjustable, sliding shelves; and meat storage.⁶⁸ Each year, as competitive pressures forced a reevaluation of the line, designers attempted to introduce new fea-

63. By 1943, over 80 percent of refrigerators were made by eight well-established companies; “That Refrigeration Boom” (n. 30 above), 161. On the similarity of appearance in refrigerators, see “Electric Servants” (n. 26 above), 10, 89; Lord and Thomas, “Engineering the Advertisements” (n. 17 above), C-23-4. General Electric, *Answers to Your Kitchen Planning Questions*, October 1940, 16, Catalog no. 38342, Trade Catalog Collection, Smithsonian Institution Libraries, National Museum of American History Branch, Washington, D.C. (hereafter NMAHB).

64. Lord and Thomas, “Engineering the Advertisements,” C-32.

65. “Reports on Products: Refrigerators,” *Consumer Reports*, May 1947, 136. On the definition of functionality by consumer advocacy groups, see Charles F. McGovern, “Sold American: Inventing the Consumer, 1890–1940” (Ph.D. diss., Harvard University, 1993).

66. On erosion of class distinctiveness in working-class diets due to assimilation pressures in the 1930s, see Levenstein (n. 38 above), 28–31. On consumption choices within a moral economy of the home, see Silverstone, Hirsch, and Morley (n. 42 above), 15–31.

67. See Marchand (n. 7 above), 270–71, on the open refrigerator as advertising tableau.

68. In addition to manufacturer and designer records cited elsewhere, this analysis is based on *Electrical Merchandising* and trade catalogs in the collections of the Smithsonian Institution Libraries, National Museum of American History, and the Hagley Museum and Library.

tures and modify the streamlined forms without transgressing the preferences of their typical buyers, as they understood them. The addition of a butter keeper or the radius of a curve took on significance. Through this process of design and redesign, a composite portrait of the average home-maker was slowly developed, and refrigerators came to reflect particular values that defined in material terms a broad middle-class standard.

Guild's work for Servel illustrates how design changes resulted from the negotiation process among engineers, designers, home economists, and female consumers. In 1934, Guild left Norge to serve as consultant for the conservative, engineering-dominated Servel.⁶⁹ Servel made the leading gas refrigerator, and its standard model was the most expensive refrigerator on the market (gas units were cheaper to operate than electrics, however, which somewhat offset the higher purchase price). The differences between gas and electric refrigerators—in addition to lower operating costs, the former ran silently— influenced consumers' purchasing decisions, but the technology had little impact on the design process or the cabinet design itself.⁷⁰ The styling of both gas and electric refrigerators reflected the same basic premises: use up-to-date styling to suggest modern technology, and aim at the average as the basis for designing a product line in which models increase in price as the number of features increases.⁷¹ Like his fellow industrial designers in the 1930s, Guild realized that successful design meant the ability to "keep pace with the times" but not be "too far away from the present acceptance."⁷²

With Guild's assistance, the Servel sales department established its own mechanism for communicating with consumers: the department began sending a truck loaded with refrigerators (fig. 6) door-to-door to survey housewives.⁷³ These surveys continued the methods and assumptions dis-

69. Louis Ruthenberg to Lurelle Guild, 5 August 1935, box 17, folder "Servel (Electrolux) 1934–36", Guild Papers. Guild established a successful relationship with Servel, serving as their consultant designer until 1949.

70. Gas and electric refrigerators used different fuel and refrigerants but had the same basic components; Haring (n. 3 above), 17, 153–54. For Servel, see Lord and Thomas, "Engineering the Advertisements," s.v. "Public Utility Service Interview." According to Tedlow (n. 6 above), 314, in 1933, Servel had about 6 percent market share. Servel manufactured gas refrigerators that were sold by the Electrolux Sales Company. For a critical analysis focusing on corporate advantage rather than technological performance as an explanation for the success of electric refrigerators over gas, see Cowan, "How the Refrigerator Got Its Hum" (n. 2 above). For the perceived limitations of gas from consumers' perspective, see Catherine Moran, "Report on Market Survey Made of Home Refrigerators," 15 February 1949, reel 16.28, Walter Dorwin Teague Papers, Syracuse University Library, Department of Special Collections, Syracuse, New York.

71. On the competition between different technologies to define modernity through styling, see Busch (n. 2 above), 222–45.

72. Lurelle Guild to Louis Ruthenberg, 8 April 1936, box 17, folder "Servel (Electrolux) 1934–36", Guild Papers.

73. "Refrigerator Design Survey," 29 August–30 September 1938, box 17, folder "Servel 1937–40", Guild Papers. It appears that Servel conducted such surveys prior to

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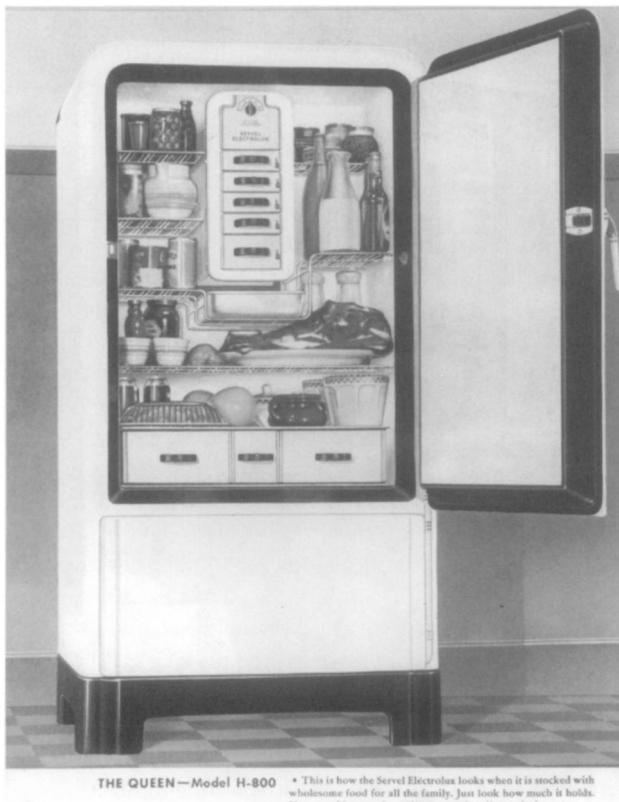
FIG. 6 The Servel truck survey, 1938. Left to right: Sears, Westinghouse, GE, Frigidaire, Stewart-Warner, Servel. (Courtesy Lurelle Guild Papers, Department of Special Collections, Syracuse University Library.)

cussed above. For example, in one survey the majority of consumers interviewed were occupants of urban, single-family homes valued at three thousand to five thousand dollars. This range was considered the middle income group.⁷⁴ Only a small percentage were occupants of apartments or row houses. Although the survey identified respondents by type and cost of home, Guild and Servel tabulated the majority opinion for each question in order to create an average consumer. There was no discussion of the different living habits or tastes of distinct socioeconomic segments, differences that might have suggested design changes.⁷⁵ Questions probed preferences regarding exterior styling and interior features, since these were reevaluated each year. Again and again, a majority of women surveyed expressed their

1937, but records are sketchy for those years. General Electric sent its magic kitchen around the country in a trailer during this period as a publicity device. It may also have been used for market research. "A Fleet of Traveling Kitchens," *Printers Ink*, 27 October 1932, 92.

74. "Refrigerator Design Survey." The cities were Indianapolis; Louisville; Nashville; Poplar Bluff, Missouri; and Mt. Vernon, Illinois. The survey tabulations mixed together the results of these cities. For the assumption of this range as a middle-income group, see Lord and Thomas, "Phase 2 in a Problem of Mass Market Penetration" (n. 14 above), chart "When Refrigerators Were Purchased."

75. "Refrigerator Design Survey." For typical designer survey methods, see Harold Van Doren, *Industrial Design*, 2d ed. (New York, 1954), 35–67. For an example of similar methods by other designers, see "Kelvinator study," chart 49, "Survey Method," Kelvinator (job file no. 415), box 47, folder 10, Geddes Papers. Geddes used drawings in his home interviews.



THE QUEEN—Model H-800 * This is how the Servel Electrolux looks when it is stocked with wholesome food for all the family. Just look how much it holds. Yet everything can be easily seen and easily reached.

FIG. 7 By the late 1930s, refrigerator design and marketing focused on labor-saving convenience, nutrition, and economy. (*Servel Electrolux Refrigerator, 1937*, Trade Catalog Collection, Smithsonian Institution Libraries, National Museum of American History Branch, Washington, D.C. Courtesy Smithsonian Institution Libraries.)

overwhelming interest in a refrigerator that seemed easy to clean and had a flexible interior arrangement with a variety of features.⁷⁶

Taking their cue from the majority opinion of this largely middle-class survey sampling, Guild and Servel worked on various aspects of the line each year. The interior arrangement and features began to tell a story about a modern standard of living (fig. 7). Other refrigerator brands offered vari-

76. "Refrigerator Design Survey"; W. A. Kuenzli, "Meeting Minutes," 2 November 1938, box 17, folder "Servel 1937-40", Guild Papers; "Servel Product Improvement Survey," January 1940, box 17, folder "Servel Product Improvement Survey", Guild Papers. The last refers to additional surveys made but not found in the files.

ations on these features and themes.⁷⁷ The major features offered in the 1937 line were the “push-pull” door latch, hydrators (used to preserve vegetables), egg container, and removable, split shelves. These features reinforced the ideas of health, preservation, and economy featured in the advertisements. The push-pull latch, which allowed women to open the door with both hands full, spoke of the plight of the servantless housewife. The hydrators told a story of changing patterns in household provisioning, which became associated with a suburban lifestyle; in the cities, frequent shopping trips or delivery services made long-term storage of such foods unnecessary, while farm families had their own supplies of vegetables and milk, as well as various other food preservation options.⁷⁸ The removable, split shelves allowed placement of a large roast or turkey. This feature emphasized economy by creating the ability to store “the big, economical roast.” But the roast also symbolized the promise of American abundance and family-centered traditions.⁷⁹ Adjustable shelves, added in 1938 in response to survey results, allowed women to adjust to their individual family needs within this design norm.⁸⁰

Although Servel based its decisions on the expressed preferences of women, these were sometimes ambiguous, and changes were not always easy to implement. Not surprisingly, company executives tended to interpret survey results in ways that involved the least risk. When the majority opinion was not clear cut, Servel executives relied on the interviewers to interpret the results, since they spent about thirty minutes with each survey respondent. Making decisions about features involved even more truck surveys and many meetings with designer, sales, and engineering executives.⁸¹

77. Guild to Ruthenberg, 8 April 1936, box 17, folder “Servel (Electrolux), 1934–36”, Guild Papers. I have based this comparative evaluation of styling and features largely on the collection of trade catalogs at Hagley Museum and Library, Wilmington, Delaware; the NMAHB; and the Warshaw collection, Archives Center, National Museum of American History, Smithsonian Institution, as well as the trade journal *Electrical Merchandising*.

78. *Servel Electrolux 1937*, catalog, NMAHB. A study by designer Norman Bel Geddes noted that urban families generally bought food three times per week, whereas nonurban (including suburban) families went to market once per week. “Kelvinator Refrigerator Presentation Stage 1” (1942–43), chart no. 2, “Marketing”, Nash Car (job file no. 415), box 27, folder 10, Geddes Papers. On the relationship between the refrigerator, the automobile, and changing shopping patterns, see James J. Flink, *The Automobile Age* (Cambridge, Mass., 1988), 164–66. On rural patterns, see Kline, *Consumers in the Country* (n. 8 above), 201.

79. *Servel Electrolux 1937*. The roast or turkey as a symbol of abundance during the depression was epitomized in Norman Rockwell’s painting “Freedom from Want.” See Robert B. Westbrook, “Fighting for the American Family: Private Interests and Political Obligation in World War II,” in Fox and Lears, *The Power of Culture* (n. 18 above), 204.

80. W. A. Kuenzli, “Meeting Minutes,” 2 November 1938. See also Geddes, “Stage 1” and “Memoranda Regarding Features of an Electric Refrigerator,” box 25, folder 10, Nash Car (job file no. 415), Geddes Papers. *Servel*, 1938, catalog, NMAHB.

81. On the ambiguity and difficulty of implementing survey preferences, see “Refrig-

Changing manufacturing techniques increased the curves associated with streamlined design. By adopting the “tangent-bender” or “bulldozer” method in order to shape the entire shell of the refrigerator from a single piece of metal, manufacturers increased the speed and economy of production. This method required that the radius in the upper corners be not less than three and one-half inches, which accentuated the curved, streamlined effect.⁸² Aesthetically, Guild wanted a more rounded top, again adding to the streamlined appearance. But, within the constraints imposed by mass production, the exact curve depended on considering the average housewife in two sometimes conflicting roles: as a shopper and as a homemaker. On one hand, the increasingly bulbous shape helped make the refrigerator stand out from its competitors on the showroom floor. On the other hand, women wanted to place articles on top of the refrigerator, so the streamlined design could not be taken to extremes. In order to “retain the ‘flat top’ sales story,” which was important to women, this crown could not be too pronounced. Additionally, Servel had to adjust its notion of the average consumer when some women surveyed complained about the height of its refrigerators.⁸³

To resolve these and several other issues, Servel sent another survey truck on the road in Florida in 1939, with a full-size wooden model of its proposed 1941 refrigerator and some competitors’ refrigerators. The interviewers reported back that the new model did not fare well with the women interviewed. One of the features a large majority rejected was Guild’s idea of a full-length door, which extended beyond the food compartment. Al-

erator Design Survey” (n. 73 above). William Hainsworth to Lurelle Guild, 9 September 1938 and 5 October 1938, box 17, folder “Servel 1937–40”, Guild Papers. The preferences expressed were also confirmed in a study conducted by Norman Bel Geddes for Kelvinator; see Geddes, “Memoranda Regarding Features of an Electric Refrigerator.” It concluded that the popular features with women were meat storage, vegetable bins (although women did not necessarily use them for vegetables), and sliding adjustable shelves. For examples of the decision process, see W. A. Kuenzli, “Meeting Minutes,” 2 November 1938. On interviewers, see “Refrigerator Design Survey”; William Hainsworth to Lurelle Guild, 6 February 1940, box 17, folder “Servel 1937–40”, Guild Papers.

82. See William Hainsworth to R. S. Taylor, 2 August 1939, and William Hainsworth, “Product Meeting” minutes, 14 September 1939, box 17, folder “Servel 1937–40”, Guild Papers. Van Doren, “Streamlining: Fad or Function?” (n. 6 above), 4. “Refrigerators on the Line” (n. 6 above), 13–16. Within a few years, all the major refrigerator companies adopted this tangent-bender method. *Servel Electrolux 1937* (n. 78 above), claimed that Servel had “the first seamless steel cabinet,” suggesting that Servel had made some change in production in order to achieve a one-piece outer shell by that time.

83. “1941 Product Industrial Design Program,” 13 November 1939, box 17, folder “Servel 1937–39”, Guild Papers. Servel termed this “full radius construction,” in which the top and door would combine to “make a uniform curvature” from the front to the sides and the front to the top. For short women, see William Hainsworth to R. S. Taylor, 2 August 1939, box 17, folder “Servel 1937–40”; “Refrigerator Design Survey”; W. A. Kuenzli, “Meeting Minutes,” 2 November 1938 (n. 76 above).

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though Guild argued that the full-length door would also be easier to clean, it appeared “too advanced in design” to these women.⁸⁴ This comment recognized that tradition played an important role in women’s acceptance. They did not accept change for its own sake. Most likely these women did not see the advantage of having a door that extended beyond the food compartment and would be more cumbersome to open.

In this case, Servel decided to rectify the major “deficiencies” in their model while it was still in the field. Calling Guild down from his home in suburban Connecticut and bringing in engineers from Indiana, they restyled the wooden model on the spot, with the assistance of local mechanics, then put the model back on the truck and drove around to the homes of an additional one hundred women.⁸⁵

Guild refused to believe that women did not want his full-length door design, which he viewed as the logical aesthetic extension of streamlining. So for this follow-up survey, Guild provided the illusion of a shorter door for the food compartment by placing a gray elastic tape across the full-length door. Each woman compared the Servel model to its competitors and expressed her opinion about the preferred exterior design. Then the elastic tape was removed, revealing the full-length door. The interviewer then explained to the women, “as you notice . . . [this cabinet] has a long door extending down to the base, I might mention without attempting to influence you that it has a storage space in the lower part for things that can be kept at room temperature.” Although the storage space could be provided with both door options, the surveyor explained, the customary shorter door would require opening a lower door to get to this storage space. Though this phrasing was clearly structured to persuade women to choose the full-length door Guild favored, the majority of women still chose the two-door option over the full-length door.⁸⁶

Based on this survey and many others, Servel executives constructed a design standard for the average housewife: “a wide cabinet having three full width unobstructed shelves below the evaporator [freezer compartment], plenty of space on the sides of the evaporator for bottles, adjustable sliding shelves, roomy interior appearance, smooth easily cleanable surfaces, two vegetable fresheners with glass tops, and a shallow meat tray interchangeable with the fresheners.”⁸⁷ The ideal refrigerator capacity for the average family was now determined to be eight cubic feet, larger than the size home economists had recommended earlier in the decade. These larger, multifeature refrigerators presumed and encouraged a suburban household provisioning

84. This December 1939 survey has not been uncovered, but see reference to it in “Servel Product Improvement Survey” (n. 76 above).

85. “Servel Product Improvement Survey.”

86. *Ibid.*

87. *Ibid.*

pattern of weekly shopping trips.⁸⁸ They embodied a modernity that reflected a logic based in the household: consumption of new technology and style, but also thrift, efficiency, cleanliness, convenience, and flexibility.

The negotiation over refrigerators reveals how women contributed to constructing design standards. These women could not speak as individuals through standardized appliances, but they could speak as a majority representing the average woman. Each year, the connection between design standards and social assumptions was forged anew in each of these seemingly trivial decisions.

For example, in planning the 1942 Servel line, the last created by the company before World War II, design work came screeching to a halt over the question of whether to offer a butter storage compartment. The idea was to offer a compartment in a part of the refrigerator that was not as cold in order to keep the butter soft for easy spreading. Guild suggested that this feature would make a good sales story. It would also use a part of the refrigerator that could not be used for preservation of other items, such as milk or meat, which needed to be colder. Servel engineers liked the idea because it was cheap.⁸⁹

Servel turned to its director of home economics, Jane Tiffany Wagner, for advice. She discouraged this idea based on her understanding of the average homemaker, which included women in both low- and moderate-income groups. Wagner argued that this compartment would be of limited use to the average homemaker, since she typically served butter cold at the table and often used butter substitutes in baking. In fact, Wagner contended that the butter storage compartment would actually be a negative factor. Butter still represented a luxury item in the average homemaker's family food budget. Therefore, the housewife would regard "with disfavor" a higher-temperature storage compartment that shortened the preservation period. Furthermore, having pushed the importance of low temperature to proper food preservation as a way of promoting mechanical refrigeration, Servel would lose the confidence of these homemakers if it provided refrigerator storage above this standard temperature. Furthermore, Wagner real-

88. These preferences of the "average housewife" were defined more broadly but similarly by Norman Bel Geddes in a study for Kelvinator refrigerators: flexible interior arrangement, easy access to the interior, an exterior design that fit in physically and visually with other kitchen equipment, and a white exterior that appeared easy to clean. Geddes, "Kelvinator study" (n. 75 above). For the assumptions about the marketing habits and food preparation habits of the typical homemaker, see Servel Home Economics Department, *Let Your Servel Electrolux Refrigerator Cut Your Budget and Food Purchasing*, 1940, NMAHB.

89. William Hainsworth to R. S. Taylor, 29 October 1940, box 17, folder "Servel 1937-40", Guild Papers. By Servel's own standards, temperatures had to be kept below 50 degrees. The butter storage compartment would keep butter at 65 degrees. Servel, *Cold Facts About Health*, 1940, NMAHB.

ized that consumers did not use the refrigerator in accordance with home economists' guidelines for the scientific arrangement of food. Consumers might use the compartment for other perishables that should be kept at a much lower temperature, leading to food deterioration and consumer dissatisfaction.⁹⁰

No doubt Servel's male executives were not terribly interested in the details so carefully outlined by Miss Wagner of the life of the average home-maker and how she buttered her bread. But they understood the bottom line: "strike the butter storage compartment" off the list.⁹¹ These manufacturers and designers, who had not yet discovered motivation research, did not spend a lot of time probing the reasons for these preferences. They simply wanted to gain market share by providing appealing products. But their decisions were nevertheless informed by the imagined domestic life of the average housewife.

A Homogeneous Vision

What was at stake in the creation of design standards during the 1930s became clear in an obscure but nevertheless significant episode in New Deal policy making: the development of a government-sponsored refrigerator. This emerged from Franklin Roosevelt's promotion of an "electrical standard of living," which defined the minimal standard of living in terms of the electrically modern home. If appliance manufacturers viewed the streamlined kitchen as the standard, New Deal programs declared that standard a right of citizenship for all Americans (fig. 8).⁹² The Electric Home and Farm Authority (EHFA), developed by Tennessee Valley Authority (TVA) director David Lilienthal in 1933, offered affordable financing for the purchase of major electrical home appliances, as a way of insuring that the TVA would have a market for the power it produced for consumers ignored by private enterprise.⁹³ An EHFA brochure stated its objective: "A

90. Jane Tiffany Wagner to William Hainsworth, 5 December 1940, box 17, folder "Servel 1937-40", Guild Papers.

91. William Hainsworth to Carl Ashby, 17 December 1940, box 17, folder "Servel 1937-40", Guild Papers.

92. On the American standard of living defined by the New Deal through modernization, see Tobey (n. 5 above). For illustrations of modernized kitchens in New Deal communities, see Lawrence Wray, "One Year Later," *Electrical Merchandising* 53 (February 1935): 8; "American Housing: A Failure, A Problem, A Potential Boon and Boom," *Life*, 15 November 1937, 45-47. Joseph Arnold, *The New Deal in the Suburbs: A History of the Greenbelt Town Program, 1935-1954* (Columbus, Ohio, 1971).

93. Field (n. 8 above); Tennessee Valley Authority, "The Kitchen Planner," 1935, RG 234 (Reconstruction Finance Corporation, Electric Home and Farm Authority), box 35, folder 412.1-11, "Kitchens (all-electric)", National Archives, Washington, D.C. (hereafter EHFA). On rural electrification programs, see Jellison (n. 38 above), 98-103, 110-11; Nye (n. 5 above), chap. 7.

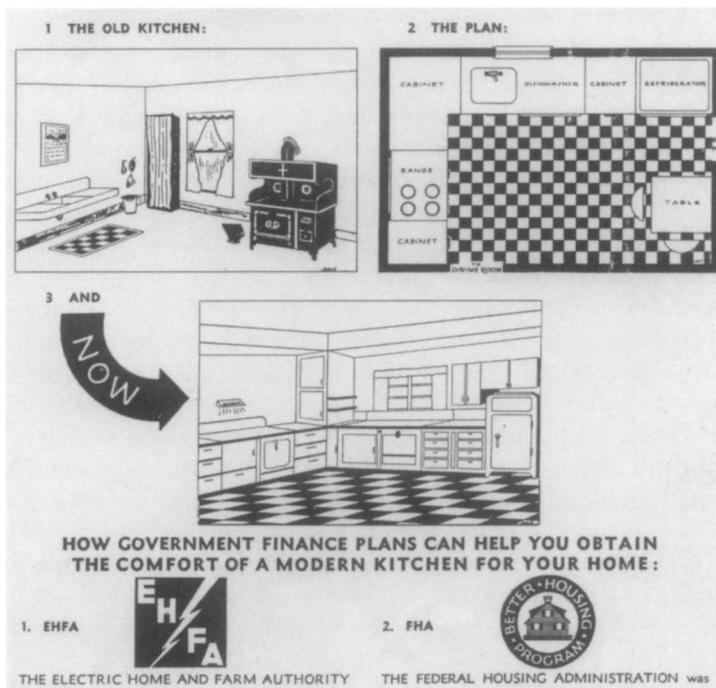


FIG. 8 The New Deal extended the promise of the streamlined kitchen as the American standard of living in this 1935 TVA "Kitchen Planner." (RG 234 [Reconstruction Finance Corporation, Electric Home and Farm Authority], box 35, folder 412.1-11, "Kitchens (all-electric)," National Archives, Washington, D.C.)

fully electrified nation is the goal . . . a merging of all classes of American people in a common understanding and a common well-being, such are the benefits of electricity."⁹⁴

Yet in practice EHFA policy hindered this idea of social integration by creating a separate design standard for EHFA-approved appliances. Although appliance manufacturers initially resisted, Lilienthal used the power of the federal government to convince companies to design a special refrigerator model based on EHFA standards, which would be sold at a price lower than the base price of their current refrigerator lines. The result was a three- to four-cubic-foot, chest-style refrigerator (that is, it opened from the top rather than the front), quite different from the manufacturers' standard designs. Sales were unimpressive.⁹⁵ As one retailer complained to TVA au-

94. Field, 49.

95. "G.E. Announces Popular Price Range and Refrigerator," *Electric Kitchen Times*, 15 June 1934, 1, 2. "Model T Appliances," *Business Week*, 16 June 1934, 11. On sales, see Field, 49–51, 55–57.

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thorities, rural consumers perceived that the government had created a "class distinction" by "financing only the low cost and smaller appliances" rather than any that met consumer needs and pocketbooks.⁹⁶ No doubt those rural consumers who desired and could afford refrigerators would have preferred products tailored to their needs. Standardization discouraged such diversity, but within its limits they understood the visual vocabulary of design and demanded at least no less than the average. Facing consumer and retailer resistance, the EHFA changed its policy, allowing financing of all models. Manufacturers did not necessarily support this policy change, since it meant that the refrigerator created at great cost specifically for the TVA suddenly had no apparent market.⁹⁷ In rejecting these small, inconvenient models in favor of the streamlined standard, rural consumers made their claim to the promises embodied in household appliances.⁹⁸

It was the technology that delineated a new standard of living, but design had a part to play in making the kitchen modern. Designers helped to define a gendered modernity by creating a homogenous visual vocabulary that articulated new values around the servantless housewife. These standards reflected the household values and lifestyles of middle-class women in suburban single-family homes, viewed as average consumers in the middle of the market, and defined norms for the larger market. In the context of the expanding market and political climate of the 1930s, the streamlined kitchen became a measure of progress—progress in the household toward middle-class status, and progress in the nation toward a mass, middle-class society.

In 1920, no such correlation between household appliances and a broadly defined middle class existed. Through a case study of refrigerator design, this article has sought to show how and why the modern kitchen became such a powerful symbol of the middle class in twentieth-century America. Historians of technology have explored the ways in which consumers have resisted the norms embedded in household technologies or given these standardized goods new meanings based on alternative personal and community values.⁹⁹ This study has examined how styling contributed to constructing the norm itself. By creating a visual vocabulary for standardized machines aimed at an average consumer, design reflected a

96. G. D. Munger to David Lilienthal, 23 October 1934, box 34, folder 411.5, PI-173, entry 299, EHFA.

97. Of 175 customers surveyed in poor, rural Lauderdale County, Alabama, who were supplied with electrical power by the TVA, twenty-nine had purchased electric refrigerators, at an average price of \$229, almost three times the price of the special TVA models. Wray, 8; Field, 49–51.

98. Mary Davis Gillies, *What Women Want in Their Kitchens of Tomorrow: A Report of the "Kitchen of Tomorrow" Contest Conducted by McCall's Magazine* (New York, 1944); Geddes, "Memoranda Regarding Features of an Electric Refrigerator" (n. 80 above).

99. Recent studies have focused on rural families. See Jellison (n. 38 above); Kline (n. 8 above).

social model of integration based on an ever-expanding middle class. These standards were not static. Changes in refrigerator and kitchen design after World War II in part reflected the fact that designers were forced to recognize growing market diversity by adjusting the average to accommodate the purchasing power of new groups of consumers. Yet despite its capacity for adaptation and expansion, what made design aimed at the average both powerful and limiting was the way it created a homogenous vision. As a result, design contributed to making the kitchen a compelling arena not only for social aspiration and belonging but also for conflicts over power in the creation of a modern, consumer society.